Allied Telesyn

CentreCOM

AT-3012TR
AT-3016TR
AT-3024TR

Multiport Repeaters

Installation Manual

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RADIATED ENERGY

U.S. Federal Communications Commission
Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved by the manufacturer or the FCC can void your right to operate this equipment.

Canadian Department of Communications
This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appariel numérique n'émet pas de bruits radioélectriques dépassant les limites appicables aux appariels numériques de Classe A. Prescrites dans le réglement sur le brouillage radioélectrique édicté par le minestére des Communications Du Canada.

SAFETY
ELECTRICAL NOTICES
WARNING: ELECTRIC SHOCK HAZARD
To prevent ELECTRIC shock, do not remove cover. No user-serviceable parts inside. This unit contains HAZARDOUS VOLTAGES and should only be opened by a trained and qualified technician. To avoid the possibility of ELECTRIC SHOCK, disconnect electric power to the product before connecting or disconnecting the LAN cables.

LIGHTNING DANGER
DANGER: DO NOT WORK on equipment or CABLES during periods of LIGHTNING ACTIVITY.

CAUTION: POWER CORD IS USED AS A DISCONNECTION DEVICE. TO DE-ENERGISE EQUIPMENT, disconnect the power cord.

INSTALLATION
ELECTRICAL—AUTO VOLTAGE ADJUSTMENT
This product will automatically adjust to any voltage between the ranges shown on the label.

ELECTRICAL—TYPE CLASS 1 EQUIPMENT
THIS EQUIPMENT MUST BE EARTHED. Power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.

ELECTRICAL—CORD NOTICE
Use power cord, maximum 4.5 meters long, rated 6 amp minimum, 250V, made of HAR cordage molded IEC 320 connector on one end and on the other end a plug approved by the country of end use.

MOUNTING INSTRUCTIONS
CAUTION: These models are designed for operation in the HORIZONTAL position. VERTICAL MOUNTING must not be done without the use of an Allied Telesyn vertical mount chassis designed for this purpose.

CAUTION: **Air vents** must **not be blocked** and must have free access to the room ambient air for cooling.

CAUTION: **DO NOT** detach rubber feet from the product unless an Allied Telesyn vertical mounting chassis is being used.

CAUTION: MECHANICAL LOADING —Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven loading.

Operating Temperature
This product is designed for a maximum ambient temperature of 40° C.

All Countries: Install product in accordance with local and National Electrical Codes.

SICHERHEIT
ACHTUNG: GEFÄHRLICHE SPANNUNG
Das Gehäuse nicht öffnen. Das Gerät enthält keine vom Benutzer wartbaren Teile. Das Gerät steht unter Hochspannung und darf nur von qualifiziertem technischem Personal geöffnet werden. Vor Anschluß der LAN-Kabel, Gerät vom Netz trennen.

GEFAHR DURCH BLITZSCHLAG
GEFAHR: Keine Arbeiten am Gerät oder an den Kabeln während eines Gewitters ausführen.

VORSICHT: DAS NETZKABEL DIENT ZUM TRENNEN DER STROMVERSORGUNG. ZUR TRENNUNG VOM NETZ, KABEL AUS DER STECKDOSE ZIEHEN.

INSTALLATION
AUTOMATISCHE SPANNUNGSEINSTELLUNG
Dieses Gerät stellt sich automatisch auf die auf dem Etikett aufgeführten Spannungswerte ein.

GERÄTE DER KLASSE 1
DIESE GERÄTE MÜSSEN GEERDET SEIN. Der Netzstecker darf nur mit einer vorschriftsmäßig geerdeten Steckdose verbunden werden. Ein unvorschriftsmäßiger Anschluß kann die Metallteile des Gehauses unter gefährliche elektrische Spannungen setzen.

NETZKABEL
Das Netzkabel sollte eine maximale Länge von 4,5 Metern, einen Nennwert von mindestens 6 A und 250 V haben, aus HAR-Material hergestellt und mit einer gepreßten, IEC 320 entsprechenden, Anschlußverbindung an einem Ende, und am anderen Ende mit einem im Land des Endverbrauchers geprüften Stecker ausgestattet sein.

MONTAGEANWEISUNGEN
VORSICHT: Diese Modelle sind für Betrieb in horizontaler Position entworfen worden. Das Gerät darf NICHT OHNE Gebrauch eines dafür entworfenen Allied Telesyn-Vertikalmontagegestells in VERTIKALER POSITION montiert werden.

VORSICHT: Die Entlüftungsöffnungen dürfen nicht versperrt sein und müssen zum Kühlen freien Zugang zur Raumluft haben.

VORSICHT: Die Gummifüße NICHT ENTFERNEN, außer bei Gebrauch des Allied Telesyn-Vertikalmontagegestells.

VORSICHT: RAMENEINBAU
Die Geräte müssen so in den Rahmen montiert werden, daß keine Gefahren durch unebenen Einbau des Rahmens verursacht werden.

BETRIEBSTEMPERATUR
Dieses Produkt wurde für den Betrieb in einer Umgebungstemperatur von nicht mehr als 40˚ C entworfen.

Alle LÄnder: Installation muß örtlichen und nationalen elektrischen Vorschriften entsprechen.

STRÅLINGSENERGI
Dette kommercielle produkt opfylder de krav, der i USA stilles til udstyr af **Klasse A**.

SIKKERHED
ELEKTRISKE FORHOLDSREGLER
ADVARSEL: RISIKO FOR ELEKTRISK STØD
For at forebygge ELEKTRISK stød, undlad at åbne apparatet. Der er ingen indre dele, der kan repareres af brugeren. Denne enhed indeholder LIVSFARLIGE STRØMSPÆNDINGER og bør kun åbnes af en uddannet og kvalificeret tekniker. For at undgå risiko for ELEKTRISK STØD, afbrydes den elektriske strøm til produktet, før LAN-kablerne monteres eller afmonteres.

FARE UNDER UVEJR
FARE: UNDLAD at arbejde på udstyr eller KABLER i perioder med LYNAKTIVITET.

ADVARSEL: DEN STRØMFØRENDE LEDNING BRUGES TIL AT AFBRYDE STRØMMEN. SKAL STRØMMEN TIL APPARATET AFBRYDES, tages ledningen ud af stikket.

INSTALLATION
ELEKTRISK—AUTOMATISK SPÆNDINGSREGULERING
Dette apparat vil automatisk tilpasse sig enhver spænding indenfor de værdier, der er angivet på etiketten.

ELEKTRISK—KLASSE 1-UDSTYR
DETTE UDSTYR KRÆVER JORDFORBINDELSE. Stikket skal være forbundet med en korrekt installeret jordforbunden stikkontakt. En ukorrekt installeret stikkontakt kan sætte livsfarlig spænding til tilgængelige metaldele.

ELEKTRISK—LEDNING
Anvend ledning af maksimum 4,5 meters længde, med en kapacitet på minimum 6 amp., 250 v, bestående af en IEC 320 connector med indstøbt HAR ledning i den ene ende og et stik i den anden ende godkendt der er af myndighederne i brugerlandet.

INSTRUKTIONER FOR OPSTILLING
ADVARSEL: Disse modeller er konstrueret til at betjenes i HORISONTAL position (vandret). VERTIKAL OPSTILLING (lodret) må IKKE FORETAGES uden brug af et Allied Telesyn vertikalt monteringsstel konstrueret til dette formål.

ADVARSEL: Ventilationsåbninger må ikke blokeres og skal have fri adgang til den omgivende luft i rummet for afkøling.

ADVARSEL: UNDLAD at fjerne gummisoklerne fra apparatet, med mindre der anvendes et Allied Telesyn vertikalt monteringsstel.

ADVARSEL: mekanisk opstilling--Udstyret skal opstilles i stativet, på en sådan måde, at der ikke opstår fare P.G.A ujavn opstilling.

BETJENINGSTEMPERATUR
Dette apparat er konstrueret til en omgivende temperatur på maksimum 40 grader C.

Alle Lande: Installation af produktet skal ske i overensstemmelse med lokal og national lovgivning for elektriske installationer.

STRALINGSENERGIE
Dit handelsprodukt werd getest en voldoet aan de Amerikaanse vereisten voor een **klasse A** toestel.

VEILIGHEID
WAARSCHUWINGEN MET BETREKKING TOT ELEKTRICITEIT
WAARSCHUWING: GEVAAR VOOR ELEKTRISCHE SCHOKKEN
Gelieve het deksel niet te verwijderen, teneinde ELEKTRISCHE schokken te voorkomen. Binnenin bevinden zich geen onderdelen die door de gebruiker kunnen worden onderhouden. Dit toestel staat onder GEVAARLIJKE SPANNING en mag alleen worden geopend door een daartoe opgeleide en bevoegde technicus. Om het gevaar op ELEKTRISCHE SCHOKKEN te vermijden, moet u het toestel van de stroombron ontkoppelen alvorens de LAN-kabels te koppelen of ontkoppelen.

GEVAAR VOOR BLIKSEMINSLAG
GEVAAR: NIET aan toestellen of KABELS WERKEN bij BLIKSEM.

WAARSCHUWING: HET TOESTEL WORDT UITGESCHAKELD DOOR DE STROOMKABEL TE ONTKOPPELEN. OM HET TOESTEL STROOMLOOS TE MAKEN: de stroomkabel ontkoppelen.

INSTALLATIE
ELEKTRISCH—AUTOMATISCHE AANPASSING VAN DE SPANNING
Dit toestel past zich automatisch aan elke spanning aan, tussen de waarden op het label vermeld.

ELEKTRISCHE—TOESTELLEN VAN KLASSE 1
DIT TOESTEL MOET GEAARD WORDEN. De stekker moet aangesloten zijn op een juist geaarde contactdoos. Een onjuist geaarde contactdoos kan de metalen onderdelen waarmee de gebruiker eventueel in aanraking komt onder gevaarlijke spanning stellen.

ELEKTRISCHE—SNOEREN
Gebruik een elektrisch snoer, maximum 4,5 meter lang, berekend voor ten minste 6 ampère, 250 V, uit HAR vervaardigd, met aan het ene uiteinde een gevormde IEC 320 stekker en aan het andere uiteinde een stekker die goedgekeurd is door het land waar het toestel zal worden gebruikt.

MONTAGE-INSTRUCTIES
WAARSCHUWING: Deze modellen zijn ontworpen om te werken in HORIZONTALE stand.
VERTICALE MONTAGE mag NIET UITGEVOERD WORDEN, tenzij een daartoe speciaal ontworpen Allied Telesyn chassis voor verticale montage wordt gebruikt.

WAARSCHUWING: De ventilatiegaten mogen niet worden gesperd en moeten de omgevingslucht ongehinderd toelaten voor afkoeling.

WAARSCHUWING: De rubberen voetjes NIET van het produkt LOSMAKEN behalve wanneer een chassis voor vertikale montage van Allied Telesyn wordt gebruikt.

WAARSCHUWING: MECHANISCH LADEN—De montage van het toestel in het rek dient zo uitgevoerd te worden dat geen gevaar ontstaat door een ongelijke lading.

Bedrijfstemperatuur
De omgevingstemperatuur voor dit produkt mag niet meer bedragen dan 40 graden Celsius.

Alle landen: het toestel installeren overeenkomstig de lokale en nationale elektrische voorschriften.

ENERGIE RAYONNEE
Ce matériel a été testé et est certifié conforme par la réglementation américaine aux normes définies pour les appareils de **classe A**.

SECURITE
INFORMATION SUR L'ELECTRICITE
AVERTISSEMENT: DANGER D'ELECTROCUTION
Pour empêcher les dangers d'ELECTROCUTION, ne pas enlever le couvercle. L'équipement ne contient aucun élément réparable par l'utilisateur. Cet appareil comprend des TENSIONS DANGEREUSES et ne doit être ouvert que par un technicien dûment qualifié. Pour éviter tout risque d'ELECTROCUTION, débrancher l'appareil de la prise de courant avant de connecter ou de déconnecter les câbles LAN.

DANGER DE FOUDRE
DANGER: NE PAS MANIER l'équipement ou les CABLES pendant les périodes d'activité orageuse.

ATTENTION: LE CORDON D'ALIMENTATION SERT DE MISE HORS CIRCUIT POUR COUPER L'ALIMENTATION DE L'APPAREIL, débranchez le cordon.

INSTALLATION
ELECTRICITE—REGLAGE DE TENSION AUTOMATIQUE
Ce produit peut s'ajuster automatiquement sur n'importe quelle tension comprise dans la plage indiquée sur le label.

ELECTRICITE—EQUIPEMENT DE CLASSE 1
CET APPAREIL DOIT ETRE MIS A LA TERRE. La prise de courant doit être branchée dans une prise femelle correctement mise à la terre. Sinon, des tensions dangereuses risqueraient d'atteindre les pièces métalliques accessibles à l'utilisateur.

ELECTRICITE—INFORMATION SUR LE CORDON
Utiliser un cordon secteur de 4,5 mètres de long maximum, calibré à 6 ampères minimum, 250V, et fabriqué en câblage HAR avec connecteur IEC 320 moulé à une extrémité et à l'autre extrémité, une prise de courant mâle répondant aux normes du pays d'utilisation.

INSTRUCTIONS DE MONTAGE
ATTENTION: Ces modèles sont destiné à fonctionner en position horizontale. L'appareil NE DOIT PAS être utilisé en MONTAGE VERTICAL sans employer un châssis de montage vertical Allied Telesyn conçu à cet effet.

ATTENTION: Ne pas bloquer les fentes d'aération, ce qui empêcherait l'air ambiant de circuler librement pour le refroidissement.

ATTENTION: NE PAS ôter les pattes d'attache en caoutchouc du produit, à moins d'utiliser un châssis de montage vertical Allied Telesyn.

ATTENTION: REPARTITION DE LA CHARGE MECANIQUE - Le montage des appareils dans le bâti doit être effectué de telle manière que la répartition de la charge mécanique ne pose aucun danger.

TEMPERATURE DE FONCTIONNEMENT
Ce produit est capable de tolérer une température ambiante maximum de 40 degrés Celsius

Pour tous pays: Installer le produit conformément aux normes électriques nationales et locales.

SÄTEILYENERGIA
Tämä kaupallinen tuote on testattu ja noudattaa Yhdysvaltojen vaatimuksia **luokan A** laitteelle.

TURVALLISUUS
SÄHKÖÖN LIITTYVIÄ HUOMAUTUKSIA
VAROITUS: SÄHKÖISKUVAARA
Estääksesi SÄHKÖISKUN älä poista kantta. Sisällä ei ole käyttäjän huollettavissa olevia osia. Tämä laite sisältää VAARALLISIA JÄNNITTEITÄ ja sen voi avata vain koulutettu ja pätevä teknikko. Välttääksesi SÄHKÖISKUN mahdollisuuden katkaise sähkövirta tuotteeseen ennen kuin liität tai irrotat paikallisverkon (LAN) kaapelit.

SALAMANISKUVAARA
HENGENVAARA: ÄLÄ TYÖSKENTELE laitteiden tai KAAPELEIDEN KANSSA SALAMOINNIN AIKANA.

HUOMAUTUS: VIRTAJOHTOA KÄYTETÄÄN VIRRANKATKAISULAITTEENA. VIRTA KATKAISTAAN irrottamalla virtajohto.

ASENNUS
SÄHKÖ—AUTOMAATTINEN JÄNNITTEENSÄÄTÖ
Tämä tuote säätää automaattisesti mihin tahansa jännitteeseen ohjetarrassa annettujen arvojen välillä.

SÄHKÖ—TYYPPILUOKAN 1 LAITTEET
TÄMÄ LAITE TÄYTYY MAADOITTAA. Pistoke täytyy liittää kunnollisesti maadoitettuun pistorasiaan. Virheellisesti johdotettu pistorasia voi altistaa metalliosat vaarallisille jännitteille.

SÄHKÖ—JOHTOON LIITTYVÄ HUOMAUTUS
Käytä seuraavanlaista virtajohtoa: maksimipituus 4,5 metriä, minimiteho 6 ampeeria, 250 V, valmistettu HAR-johdostosta, muovattu IEC 320 -liitin toisessa päässä ja käyttömaassa hyväksytty pistoke toisessa päässä.

ASENNUSSOHJEET
HUOMAUTUS: Nämä mallit on suunniteltu käytettäviksi VAAKA-asennossa. PYSTYASENNUSTA EI SAA TEHDÄ ilman Allied Telesyn -pystykiinnitysalustaa, joka on suunniteltu tähän tarkoitukseen.

HUOMAUTUS: Ilmavaihtoreikiä ei pidä tukkia ja niillä täytyy olla vapaa yhteys ympäröivään huoneilmaan, jotta ilmanvaihto tapahtuisi.

HUOMAUTUS: ÄLÄ irroita kumijalkoja tuotteesta, ellei Allied Telesyn-pystykiinnitysalusta ole käytössä.

HUOMAUTUS: mekaaninen kuormitus--Osien asennuksen alustaan tulee tapahtua siten, että epätasainen kuormitus ei aiheuta vaaraa.

KÄYTTÖLÄMPÖTILA
Tämä tuote on suunniteltu ympäröivän ilman maksimilämpötilalle 40° C.

Kaikki maat: Asenna tuote paikallisten ja kansallisten sähköturvallisuusmääräysten mukaisesti.

ENERGIA IRRADIATA
Questo prodotto commerciale è stato collaudato e risponde ai requisiti U.S.A. per i dispositivi di **classe A**.

NORME DI SICUREZZA
AVVERTENZE ELETTRICHE
ATTENZIONE: PERICOLO DI SCOSSE ELETTRICHE
Per evitare SCOSSE ELETTRICHE non asportare il coperchio. Le componenti interne non sono riparabili dall'utente. Questa unità ha TENSIONI PERICOLOSE e va aperta solamente da un tecnico specializzato e qualificato. Per evitare ogni possibilità di SCOSSE ELETTRICHE, interrompere l'alimentazione del dispositivo prima di collegare o staccare i cavi LAN.

PERICOLO DI FULMINI
PERICOLO: NON LAVORARE sul dispositivo o sui CAVI durante PRECIPITAZIONI TEMPORALESCHE.

ATTENZIONE: IL CAVO DI ALIMENTAZIONE È USATO COME DISPOSITIVO DI DISATTIVAZIONE.
PER TOGLIERE LA CORRENTE AL DISPOSITIVO staccare il cavo di alimentazione.

INSTALLAZIONE
ELETTRICITÀ—REGOLAZIONE AUTOMATICA DELLA TENSIONE
Questo prodotto regolerà automaticamente la tensione ad un valore compreso nella gamma indicata sull'etichetta.

ELETTRICITÀ—DISPOSITIVI DI CLASSE 1
QUESTO DISPOSITIVO DEVE AVERE LA MESSA A TERRA. La spina deve essere inserita in una presa di corrente specificamente dotata di messa a terra. Una presa non cablata in maniera corretta rischia di scaricare una tensione pericolosa su parti metalliche accessibili.

ELETTRICITÀ—AVVERTENZA SUL CAVO
Usare un cavo della lunghezza massima di metri 4,5, con capacità minima di 6 A, 250 V, di filo HAR, dotato di connettore stampato IEC 320 ad un'estremità e di spina approvata dal paese di destinazione all'altra.

ISTRUZIONI PER IL MONTAGGIO
ATTENZIONE: questi modelli sono concepiti per il funzionamento in posizione ORIZZONTALE. NON È POSSIBILE EFFETTUARE IL MONTAGGIO VERTICALE senza utilizzare l'apposito telaio per il montaggio verticale Allied Telesyn.

ATTENZIONE: le prese d'aria non vanno ostruite e devono consentire il libero ricircolo dell'aria ambiente per il raffreddamento.

ATTENZIONE: NON staccare il piedino in gomma dal prodotto tranne qualora si utilizzi il telaio Allied Telesyn per il montaggio verticale.

ATTENZIONE: CARICAMENTO MECCANICO - Il montaggio del dispositivo sul supporto va effettuato in maniera tale da evitare qualsiasi potenziale condizione di pericolo eventualmente dovuta al montaggio irregolare.

Temperatura di funzionamento
Questo prodotto è concepito per una temperatura ambientale massima di 40 gradi centigradi.

Tutti i paesi: installare il prodotto in conformità alle vigenti normative elettriche nazionali.

UTSTRÅLT ENERGI
Dette kommersielle produktet har blitt testet og er i samsvar med amerikanske krav for et **A-Klasse** apparat.

SIKKERHET
ELEKTRISKE MEDDELELSE
ADVARSEL: FARE FOR ELEKTRISK SJOKK
For å unngå ELEKTRISK sjokk, må dekslet ikke tas av. Det finnes ingen deler som du kan bruke på innsiden. Denne enheten inneholder FARLIGE SPENNING, og må kun åpnes av en opplært, kvalifisert tekniker. For å unngå muligheten av ELEKTRISK SJOKK, må den elektriske strømmen til produktet være av når du slår LAN-ledninger av og på.

FARE FOR LYNANTENNELSE
FARE: MÅ IKKE BRUKES på utstyr eller ledninger mens LYN-AKTIVITET er i gang.

FORSIKTIG: STRØMLEDNINGEN BRUKES TIL Å SLÅ APPARATET AV. HVIS DU VIL DEAKTIVISERE UTSTYRET, må du fjerne strømledningen.

INSTALLASJON
ELEKTRISK—AUTO SPENNINGSTILPASSING
Dette produktet vil automatisk bli tilpasset hvilken som helst strøminnstilling i de områdene som vises på etiketten.

ELEKTRISKE—TYPE 1. KLASSE UTSTYR
DETTE UTSTYRET MÅ JORDES. Strømkontakten må være tilkoplet en korrekt jordet grunnstøpselkontakt. En støpselkontakt som ikke er jordet på rett måte, kan tilføre farlig spenning til lett tilgjengelige metalldeler.

ELEKTRISKE—MEDDELELSE OM LEDNINGER
Bruk en strømledning av maksimal størrelse 4,5 m i lengde, vurdert for minst av 6 amp, 250V, fremstilt av HAR ledning IEC 320 koplingsstykke på den ene kanten og på den andre kanten en plugg som har blitt godkjent i det landet hvor den siste brukeren befinner seg.

BRUKSANVISNINGER FOR MONTERING
FORSIKTIG: Disse modellene er beregnet til bruk i HORISONTAL stilling. VERTIKAL MONTERING må IKKE UTFØRES uten bruk av et Allied Telesyn vertikal monteringschassis som er spesiallaget til dette formål.

FORSIKTIG: Luftventilene må ikke blokkeres og må ha fri tilgang til luft med romtemperatur for avkjøling.

FORSIKTIG: Gummiføttene må IKKE fjernes fra produktet med mindre en Allied Telesyn vertikal monteringschassis er i bruk.

FORSIKTIG: MEKANISK LASTNING Installering av utstyret på hyllen må utføres på slik måte at ingen farlige situasjoner oppstår som en følge av ujevn lastning.

Driftstemperatur
Dette produktet har blitt fremstilt til bruk med maksimum romtemperatur på 40 grader celsius.

Alle land: Produktet må installeres i samsvar med de lokale og nasjonale elektriske koder.

ENERGIA IRRADIADA
Este produto foi testado e atende aos requisitos para dispositivos comerciais de **Classe A** nos E.U.A.

SEGURANÇA
AVISOS SOBRE CARACTERÍSTICAS ELÉTRICAS
ATENÇÃO: PERIGO DE CHOQUE ELÉTRICO
Para evitar CHOQUE ELÉTRICO, não retire a tampa. Não contém peças que possam ser consertadas pelo usuário. Este aparelho contém VOLTAGENS PERIGOSAS e só deve ser aberto por um técnico qualificado e treinado. Para evitar a possibilidade de CHOQUE ELÉTRICO, desconecte o aparelho da fonte de energia elétrica antes de conectar e desconectar os cabos da LAN.

PERIGO DE CHOQUE CAUSADO POR RAIO
PERIGO: NÃO TRABALHE no equipamento ou nos CABOS durante períodos suscetíveis de QUEDAS DE RAIO.

CUIDADO: O CABO DE ALIMENTAÇÃO É UTILIZADO COMO UM DISPOSITIVO DE DESCONEXÃO.
PARA DESELETRIFICAR O EQUIPAMENTO desconecte o cabo de alimentação.

INSTALAÇÃO
ELÉTRICO—AJUSTE AUTOMÁTICO DE VOLTAGEM
Este produto ajustar-se-á automaticamente a qualquer voltagem que esteja dentro dos limites indicados no rótulo.

ELÉTRICO—EQUIPAMENTOS DO TIPO CLASSE 1
DEVE SER FEITA LIGAÇÃO DE FIO TERRA PARA ESTE EQUIPAMENTO. O plugue deve ser conectado a uma tomada com ligação de fio terra. Tomadas sem ligação de fio terra podem transmitir voltagens perigosas a peças metálicas expostas.

ELÉTRICO—AVISO SOBRE O CABO DE ALIMENTAÇÃO
Use cabo de alimentação com comprimento máximo de 4, 5 metros, com uma capacidade mínima de 6 amp e 250 V, fabricado de material para cabo HAR com conector moldado IEC 320 em uma extremidade e, na outra extremidade, um plugue aprovado para uso no país em questão.

INSTRUÇÕES DE INSTALAÇÃO
CUIDADO: Este modelos foram projetados para funcionar na posição HORIZONTAL. NÃO DEVE SER EFETUADA INSTALAÇÃO VERTICAL sem o uso de um chassis de montagem vertical Allied Telesyn projetado para este fim específico.

CUIDADO: As entradas de ar não devem ser bloqueadas e devem ter acesso livre ao ar ambiente para arrefecimento adequado do aparelho.

CUIDADO: **NÃO RETIRE** os calços de borracha do produto a menos que esteja sendo usado um chassis de montagem vertical Allied Telesyn.

CUIDADO: CARREGAMENTO - O equipamento deverá ser montado no suporte de montagem de forma a não causar perigo devido a carregamento não-uniforme.

TEMPERATURA DE FUNCIONAMENTO
Este produto foi projetado para uma temperatura ambiente máxima de 40 graus centígrados.

Todos os países: Instale o produto de acordo com as normas federais e locais para instalações elétricas.

ENERGIA RADIADA
Este producto comercial ha sido probado y cumple con las normas requeridas en los EE. UU. para un dispositivo de **Clase A**.

SEGURIDAD
AVISOS ELECTRICOS
ADVERTENCIA: PELIGRO DE ELECTROCHOQUE
Para evitar un ELECTROCHOQUE, no quite la tapa. No hay ningún componente en el interior al cual puede prestar servicio el usuario. Esta unidad contiene VOLTAJES PELIGROSOS y sólo deberá abrirla un técnico entrenado y calificado. Para evitar la posibilidad de ELECTROCHOQUE desconecte la corriente eléctrica que llega al producto antes de conectar o desconectar los cables LAN.

PELIGRO DE RAYOS
PELIGRO: NO REALICE NINGUN TIPO DE TRABAJO O CONEXION en los equipos o en LOS CABLES durante TORMENTAS DE RAYOS.

ATENCION: EL CABLE DE ALIMENTACION SE USA COMO UN DISPOSITIVO DE DESCONEXION. PARA DESACTIVAR EL EQUIPO, desconecte el cable de alimentación.

INSTALACION
ELECTRICO—AUTO-AJUSTE DE TENSION
Este producto se ajustará automáticamente a cualquier tensión entre los valores máximos y mínimos indicados en la etiqueta.

ELECTRICO—EQUIPO DEL TIPO CLASE 1
ESTE EQUIPO TIENE QUE TENER CONEXION A TIERRA. El cable tiene que conectarse a un enchufe con tierra debidamente instalado. Un enchufe que no está correctamente instalado podría ocasionar tensiones peligrosas en las partes metálicas están expuestas.

ELECTRICO—ADVERTENCIA SOBRE EL CABLE
Use un cable eléctrico con un máximo de 4, 5 metros de largo, con una capacidad mínima de 6 amperios, 250 V, hecho de cable HAR, con el conector moldeado IEC 320 en un extremo y con un enchufe que está aprobado por el país de uso final en el otro.

INSTRUCCIONES DE MONTAJE
ATENCION: Estos modelos están diseñados para operar en posición HORIZONTAL. NO SE DEBEN MONTAR VERTICALMENTE sin el uso de un chasis de montaje vertical de Allied Telesyn que se ha diseñado para este fin.

ATENCION: Las aberturas para ventilación no deberán bloquearse y deberán tener acceso libre al aire ambiental de la sala para su enfriamiento.

ATENCION: NO separe las patas de goma del producto a menos que se esté usando un chasis de montaje vertical de Allied Telesyn.

ATENCION: CARGA MECANICA - El montaje del equipo en el bastidor debe realizarse de manera tal que no cause una condición peligrosa debido a la distribución desigual del peso.

Temperatura requerida para la operación
Este producto está diseñado para una temperatura ambiental máxima de 40 grados C.

Para todos los países: Monte el producto de acuerdo con los Códigos Eléctricos locales y nacionales.

ENERGIUTSTRÅLNING
Denna handelsprodukt har testats och befunnits vara i enlighet med **U.S.A.s krav för klass A** utrustning.

SÄKERHET
TILLKÄNNAGIVANDEN BETRÄFFANDE ELEKTRICITETSRISK:
RISK FÖR ELEKTRISK STÖT
För att undvika ELEKTRISK stöt, ta ej av locket. Det finns inga delar inuti som behöver underhållas. Denna apparat är under HÖGSPÄNNING och får endast öppnas av en utbildad kvalificerad tekniker. För att undvika ELEKTRISK STÖT, koppla ifrån produktens strömanslutning innan LAN-kablarna ansluts eller kopplas ur.

FARA FÖR BLIXTNEDSLAG
FARA: ARBETA EJ på utrustningen eller kablarna vid ÅSKVÄDER.

VARNING: NÄTKABELN ANVÄNDS SOM STRÖMBRYTARE FÖR ATT KOPPLA FRÅN STRÖMMEN, dra ur nätkabeln.

INSTALLATION
ELEKTRISKT—AUTOMATISK SPÄNNINGSJUSTERING
Denna produkt justeras automatiskt till alla spänningar inom omfånget som indikeras på produktens märkning.

ELEKTRISKT—TYP KLASS 1 UTRUSTNING
DENNA UTRUSTNING MÅSTE VARA JORDAD. Nätkabeln måste vara ansluten till ett ordentligt jordat uttag. Ett felaktigt uttag kan göra att närliggande metalldelar utsätts för högspänning. Apparaten skall anslutas till jordat uttag, när den ansluts till ett nätverk.

ELEKTRISKT—ANMÄRKNING BETRÄFFANDE KABELN
Använd en kabel med maximum längd 4,5 meter och minimum 6 amp nominal, 250V, av HAR kabelfabrikat med ett specialutformat IEC 320-kontaktdon i ena änden och i den andra en plugg som godkänts i landet där produkten används.

MONTERINGSINSTRUKTIONER
VARNING: Dessa modeller är konstruerade för användning i HORISONTALLÄGE. VERTIKALMONTERING får EJ UTFÖRAS utan att ett Allied Telesyn specialkonstruerat vertikalt monteringschassi används.

VARNING: Luftventilerna får ej blockeras och måste ha fri tillgång till omgivande rumsluft för avsvalning.

VARNING: Ta ej bort gummifötterna från produkten om inte ett Allied Telesyn vertikalt monteringschassi används.

VARNING: MEKANISK BELASTNING: Utrustningen ska installeras i chassit på så sätt att fara inte uppstår p g a ojämn belastning.

DRIFTSTEMPERATUR
Denna produkt är konstruerad för rumstemperatur ej överstigande 40 grader Celsius.

Alla länder: Installera produkten i enlighet med lokala och statliga bestämmelser för elektrisk utrustning.

Table of Contents

Chapter 1

Overview

CentreCOM AT-30*xx*TR Multiport Repeaters

Concepts

CentreCOM AT-30*xx*TR Multiport Repeaters provide low-cost connection for up to 24 IEEE 802.3 10BASE-T network segments. The series includes three different models, featuring 12, 16 and 24 RJ45 port connections for 10BASE-T networks.

In addition to the twisted pair interfaces, each unit includes a choice of two network ports for interconnection to a network backbone:

- An IEEE 802.3 10BASE5 Attachment Unit Interface (AUI) for attachment to coaxial (thick) Ethernet or an external transceiver
- A 10BASE2 BNC (Bayonet Nut Couple) port for attachment to thin Ethernet

In this way, the repeater enables you to connect between the different media (thick or thinnet coaxial, fiber optic and twisted pair) with the possible addition of the appropriate transceiver.

The AT-30*xx*TR Multiport Repeaters utilize the latest technologies, including a custom Application Specific Integrated Circuit (ASIC) and Surface Mount Technology (SMT) which provide enhanced functionality, increased reliability, and improved price and performance.

Packet Regeneration. *Packet regeneration* is a high-performance network repeater feature that includes the regenerating of the packet preamble, retiming of data packets, and the extension of collision fragments.

Link Integrity. The IEEE 802.3 defined link integrity test function continually monitors the twisted pair cable to ensure link continuity of the receive pair between the user node and the repeater.

Auto Partitioning. Also known as segmentation; each segment will be automatically partitioned whenever 32 consecutive collisions or one long collision consisting of between 125 and 3750 Bytes are seen on the segment. One valid packet will reset the segment and return it to auto reconnecting segment.

Jabber Lock-up Protection. Jabber lock-up protects the repeater from being overrun with data packets from a possibly defective device. That is, jabber lock-up automatically prevents transmitted data from reaching the repeater if the transmitted data time exceeds a specified duration (in the range of 20 to 150 ms).

Features

Network diagnostics are provided on the front panel of the AT-30*xx*TR repeaters, as shown in Figure 1, 2 and 3, to aid in troubleshooting and fault isolation. Each 10BASE-T network segment has two LEDs, packet "Receive" and "Port OK." In addition, there are three central LEDs indicating "Power," "Activity," and "Collision" for the repeater as a whole, and a pair of LEDs that show "Port OK" or "Receive" state for the AUI and BNC ports.

Each model includes switches that enable manual termination of the BNC network port and internal signal crossover (MDI/MDI-X) on 10BASE-T Port #1.

The CentreCOM Multiport Repeaters conform to the IEEE 802.3 specifications. This permits a maximum of four repeaters to be "cascaded" through one of the 10BASE-T ports and enables up to 1024 individual segments to be configured into a single network by the extended use of fan-outs (see Chapter 7 for configuration diagrams).

Figure 1, 2 and 3 show the front panel layouts for the three AT-30*xx*TR models:

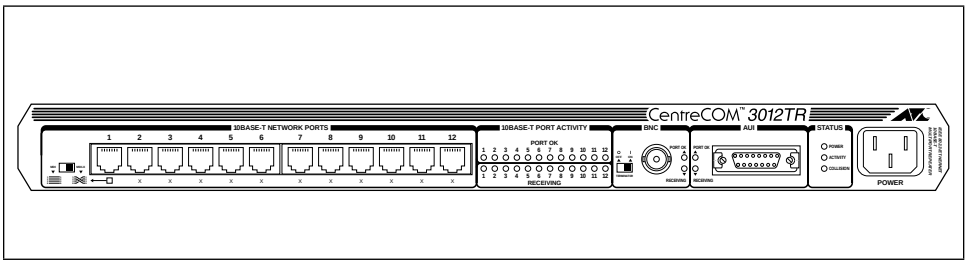

Figure 1: AT-3012TR Front Panel

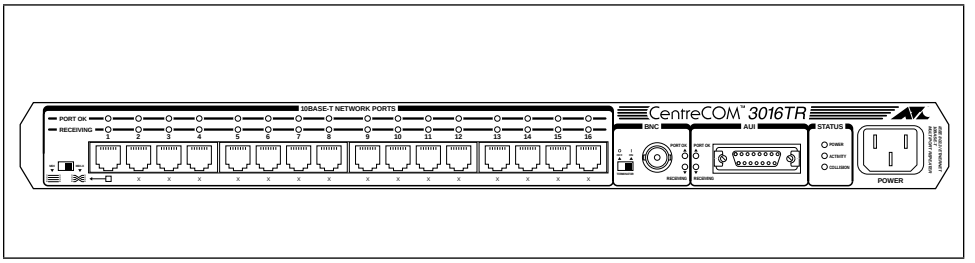

Figure 2: AT-3016TR Front Panel

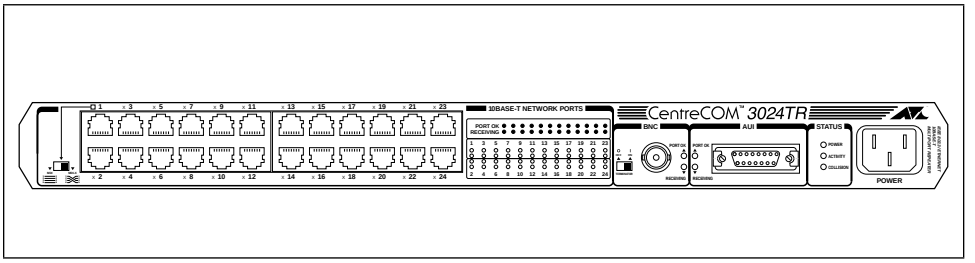

Figure 3: AT-3024TR Front Panel

The following checklist highlights the features found on each AT-30*xx*TR repeater. The remaining chapters of this manual discuss specifics of the port connections, indicators, and switches on each model.

- ❑ IEEE 802.3 compliant 10BASE-T repeater, Ethernet Version 1.0 and 2.0 compatible
- ❑ Supports all standard Ethernet media, including fiber optic, via AUI port (external transceiver may be required for the backbone)
- ❑ Choice of AUI port or BNC port for backbone connections
- ❑ 12, 16 or 24 10BASE-T (RJ45) network ports, depending on model
- ❑ Standalone or department concentrator applications
- ❑ Automatic partitioning of network segments
- ❑ Packet regeneration and retiming and jabber lock up protection
- ❑ Receive and Port OK LEDs per port
- ❑ Status and diagnostic LEDs
- ❑ MDI/MDI-X switch that enables cascading of hubs without a special crossover cable
- ❑ Standalone or rack mountable
- ❑ One year warranty

Quick Installation Checklist

Setup

If you are experienced with AT-30*xx*TR multiport 10BASE-T repeaters, use the following procedure. If you are not familiar with this type of repeater, review this list and go on to the next chapter for more detailed installation information.

1. Carefully unpack the AT-30*xx*TR. Retain the packing materials until satisfactory installation has been achieved.
2. Place the AT-30*xx*TR in a location with adequate ventilation and power receptacles.
3. Apply power to the repeater by attaching the power cable.
4. Test your unit's connectivity, as described in "Testing," below.
5. If you are attaching the repeater to a network backbone, connect an appropriate cable to either the AUI or BNC network port (you may use an external transceiver for any other media connection to the AUI port, if desired).
6. Attach 10BASE-T UTP cables, with RJ45 connectors attached, to 10BASE-T station ports.

Testing

You should check the Port OK LED for each 10BASE-T port that is being used. ON indicates a valid link. There are two methods for doing this:

One method uses a transceiver connection to the AUI port

1. Connect an AT-210T Transceiver to the repeater's AUI port.

   Attach one end of a straight-through UTP cable to the transceiver's 10BASE-T receptacle, and the other end to Port #1; make sure the MDI/MDI-X switch is set to the MDI-X (crossover) setting (see Figure 4).

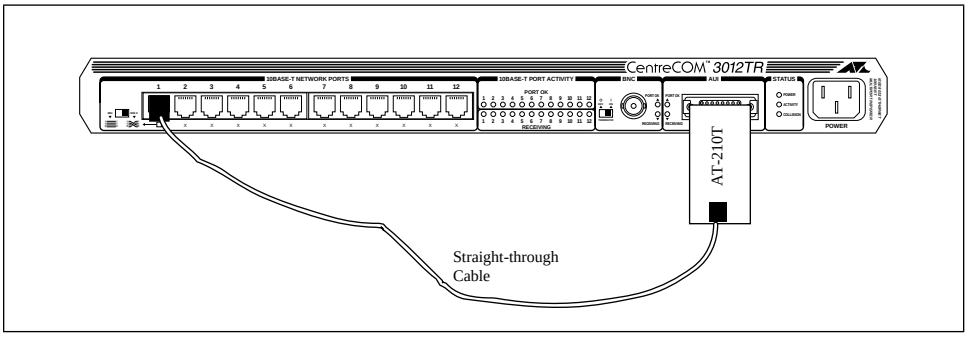

Figure 4: AT-3012TR Test Connection

2. Check for valid LED settings:
   - — Port OK #1 should be lit on the repeater side of the connection.
   - — The Link LED on the AT-210T should also be lit.
3. Leaving the transceiver connection intact, connect the other end of the cable in turn to each of the other 10BASE-T ports and check the LEDs.

The other method uses existing network devices

1. Establish a network connection from Port #1 to a network device (such as a server) and from Port #2 to a workstation. Make sure both Port OK LEDs are lit.
2. After a successful connection, disconnect the active 10BASE-T connector from Port #2 and connect it to the next successive port (i.e., Port #3). Continue until all 10BASE-T ports have been validated with good network connections.

Chapter 2

Installation

Site Requirements

Attention

Before installing AT-30*xx*TR repeaters, read the electrical safety and installation requirements starting on page i.

If the installer is experienced with the AT-30*xx*TR repeater and does not need detailed installation instructions, refer to Quick Installation Checklist in Chapter 1 of this manual.

Ventilation

AT-30*xx*TR multiport 10BASE-T repeaters have vents on the sides for air circulation. Do not restrict the flow of air through these openings. Obstructing the passages may cause overheating and possible component damage.

Power

Check your network cabling for proper configuration before installing the repeater. Make absolutely sure that the voltage and frequency applied are of the correct values for your AT-30*xx*TR.

Note

The AT-30*xx*TR is equipped with an universal power supply that will accept either 100-120 or 200-240 VAC power at 50 or 60 Hz as appropriate.

There is no external power switch for AT-30*xx*TR model repeaters. Power is applied as soon as you connect the power cord. Make sure that you locate the unit near an easily accessible AC outlet so that you can easily disconnect the power cord.

Port Configurations

Station Ports

Each AT-30*xx*TR repeater includes a bank of 10BASE-T station port receptacles equipped with shielded RJ45 connectors. The model number indicates the number of station ports, as shown in Table 1 on the following page. The layout and numbering of the ports varies depending on the model type; refer to Chapter 3, 4 or 5 as appropriate.

Table 1: AT-30xxTR Model Types

Model Number	Number of Station Ports	Specification
AT-3012TR	12	Single bank of two 1x6 units
AT-3016TR	16	Single bank of four 1x4 units
AT-3024TR	24	Double-stacked; two banks of 1x12 units

AUI Network Port

Each AT-30*xx*TR repeater has one Attachment Unit Interface (AUI) port to accommodate a 10BASE5 or thick Ethernet connection to the network backbone via a drop cable.

BNC Network Port

Each AT-30*xx*TR repeater has one Bayonet Nut Couple (BNC) port to accommodate a 10BASE2 or thin Ethernet connection to the network backbone via a link segment.

LED Indicators

Hub Status Indicators

A three-high LED at the far right of the front panel, next to the power receptacle, indicates the overall status of the repeater unit. See Figure 5 for location of these indicators.

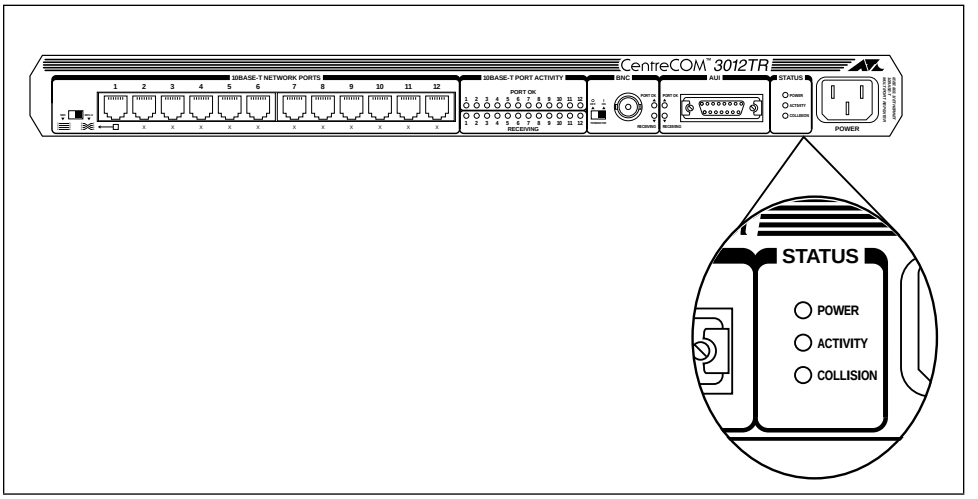

Figure 5: AT-30xxTR Hub Status LEDs

Power (green)—The top LED illuminates when power is applied.

Activity (green)—The middle LED indicates that the repeater is functional and is transmitting packets.

Collision (yellow)—The bottom LED will flicker to indicate collision. Occasional collisions are normal in Ethernet networks. Excessive collisions is an indication of possible segment problems. A constantly illuminated Collision LED may indicate that there is a port, cabling, or excessive traffic problem.

Network Port Indicators

A two-high set of LEDs located between and integrated with the BNC and AUI connectors on the front panel (see Figure 6) indicates which network port connection is in use. The left LEDs light if the BNC port is in use and the right LEDs light if the AUI port is in use (you can use both network ports at the same time, in which case both sets of LEDs will light up).

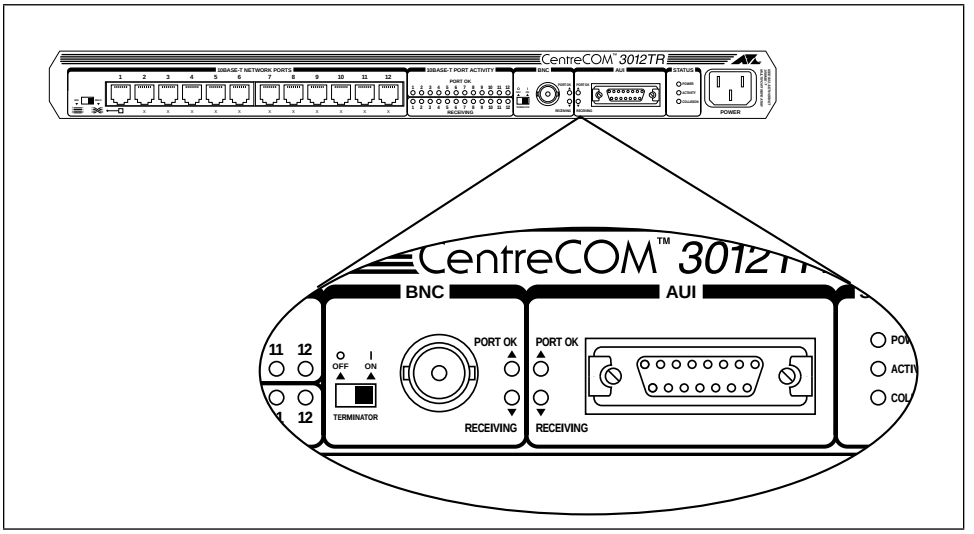

Figure 6: AT-30xxTR Network Ports

Station Port Status Indicators

A pair of LEDs indicate the status of each of the 10BASE-T port connections. The upper (green) LED in the pair (Port OK) lights if the port has a valid link, and the lower (yellow) LED (Receiving) lights if the port is receiving data. Refer to Chapter 3, 4 or 5 for locations of the port status indicators, which vary depending on the number of ports per model.

Switches

BNC Termination Switch

The BNC Termination Switch is located on the front panel to the left of the BNC receptacle (see Figure 6 above). You use this switch to enable or disable internal termination at this end of the 10BASE2 segment:

- Use the OFF position to disable termination if you are installing a link segment with a BNC-T connector on this port.
- Use the ON position to enable termination if you are installing a link segment without a BNC-T connector at this port and the unit is at the end of the cable.

MDI/MDI-X Switch

The 10BASE-T RJ45 ports on the AT-30*xx*TR hubs are generally used for network connections between the hub and a transceiver. Such connections require a standard “straight-through” cable, meaning that a pin at one end connects to a pin with the same number at the other end.

However, you may want to use one of the 10BASE-T ports to link one hub to another (you can also connect hub to hub via the network port). This type of connection requires the signal to “crossover” so that the TX pin at one end connects to the RX pin at the other end. You can accomplish this in either of two ways:

- ❑ You can use a special crossover cable, available commercially at most electronic outlets.
- ❑ You can use a built-in method for internally crossing the signal over, before it is transmitted through the cable.

ATI has incorporated the latter feature into the AT-30*xx*TR models. The Medium Dependent Interface (MDI/MDI-X) switch at the far left of the AT-30*xx*TR front panel converts RJ45 Port #1 from a normal network connector into an internally crossed-over port for hub-to-hub connection:

- ❑ The default setting for the switch is MDI-X (standard RJ45 port) (see Figure 7).
- ❑ If you want to use Port #1 to connect two hubs, you must set the switch on one, and only one, of the hubs to the MDI position.

By using the MDI/MDI-X switch, you can connect two hubs via standard straight-through cable. The switch affects Port #1 only; you can continue to use all the other 10BASE-T ports for network connections via straight-through cable, no matter which way you set the MDI/MDI-X switch.

If you connect a straight-through cable (or any cable for that matter) between two hubs (or any two nodes), and the network LEDs do not indicate a link condition, change the MDI/MDI-X switch to the other setting. The repeater will not be damaged if the MDI switch is in the wrong position.

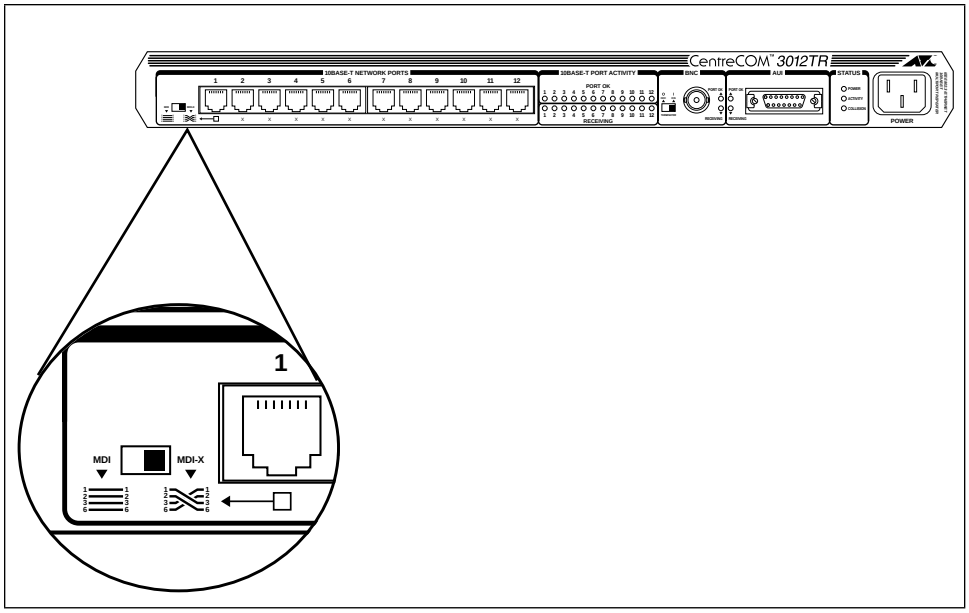

Figure 7: MDI/MDI-X Switch

Installation

1. Carefully remove the repeater from its packaging materials. Retain the packing materials until satisfactory installation has been achieved.
2. Place the repeater in its operating area.
3. Apply power to the unit by plugging in the power cord. Check that the green Power LED on the front panel lights up.
4. If you are connecting the AT-30*xx*TR repeater to an external transceiver, attach an AUI cable to the 15-pin AUI connector on the front panel. Ensure that the external transceiver has its Signal Quality Error (SQE)/ Heartbeat Test function disabled. When power is applied to the repeater, the external transceiver should also have power.

Connections

10BASE-T UTP cables can be up to 100 meters (328 ft.) in length. The cable should be 22 to 26 AWG UTP wire with 100 Ω impedance. The AT-30*xx*TR repeater uses RJ45 modular connectors for its 10BASE-T connections.

System Check

1. Establish a connection from the device connected to Port #1 to the device connected to Port #2.
2. Once the connection between devices attached to 10BASE-T Port #1 and #2 has been successfully established, remove the RJ45 connector from Port #2 and connect it to each of the subsequent AT-30*xx*TR 10BASE-T ports to verify their functions.
3. If all ports test successfully, install the rest of the 10BASE-T RJ45 connections and ensure that the Port OK LED for each port is illuminated. Remember, the 10BASE-T device on the opposite end of the UTP cable must be operational.

Note 

The Port OK LED validates the receive pair only. The opposite end of the UTP segment is responsible for validating the transmit pair.

Chapter 3

AT-3012TR Connectivity

Front Panel Layout

The AT-3012TR Multiport Repeater has 12 10BASE-T network ports supplied with shielded RJ45 connectors. The front panel layout is shown in Figure 8.

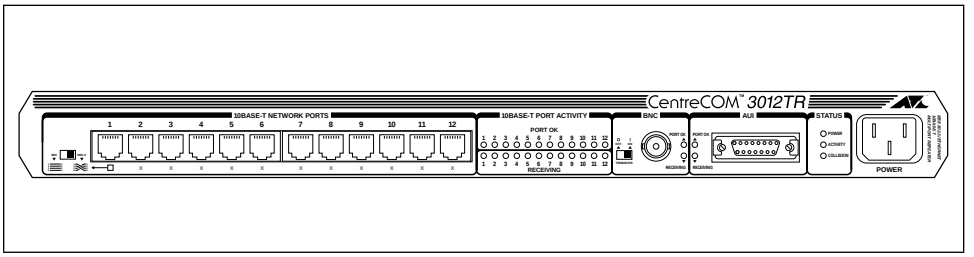

Figure 8: AT-3012TR Front Panel Layout

Port Indicators

The AT-3012TR Repeater has LEDs for each port arranged in a central bank to provide status information easily, as shown in Figure 9.

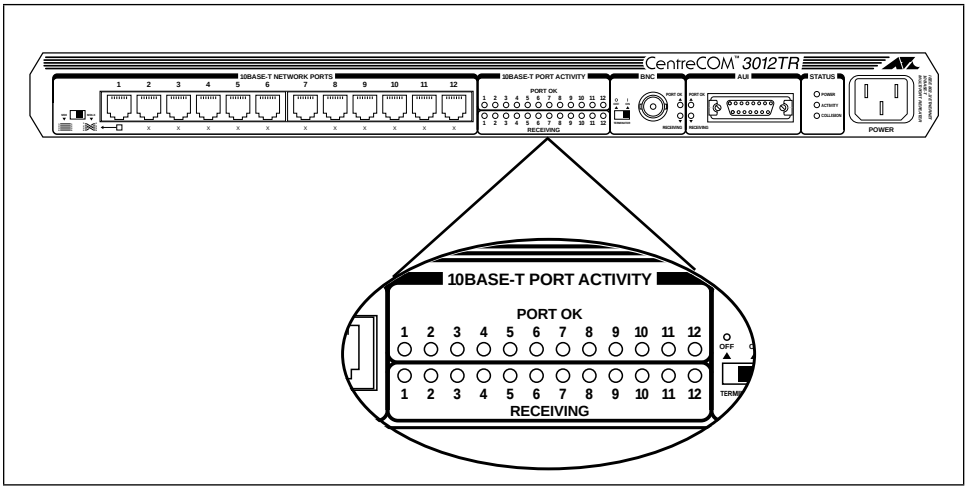

Figure 9: AT-3012TR Port Indicators

PORT OK—This LED indicates that a valid link has been established and the port is not partitioned.

RECEIVING—This LED flashes when incoming packets are present on the respective segment.

Chapter 4

AT-3016TR Connectivity

Front Panel Layout

The AT-3016TR Multiport Repeater has 16 10BASE-T network ports supplied with shielded RJ45 connectors. The front panel layout is shown in Figure 10.

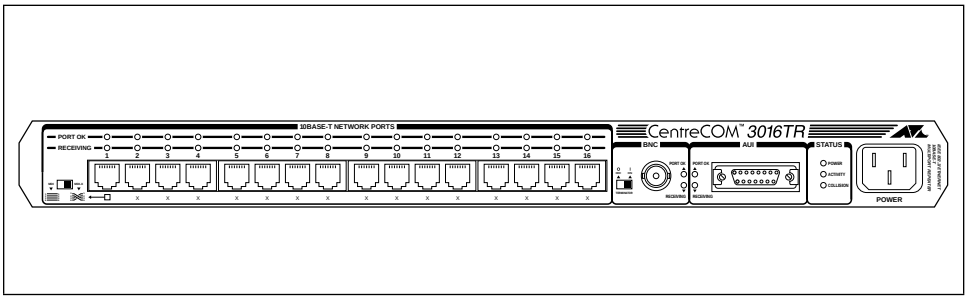

Figure 10: AT-3016TR Front Panel Layout

Port Indicators

The AT-3016TR Repeater has a pair of LEDs for each port to provide status information easily; three of these pairs are shown in Figure 11.

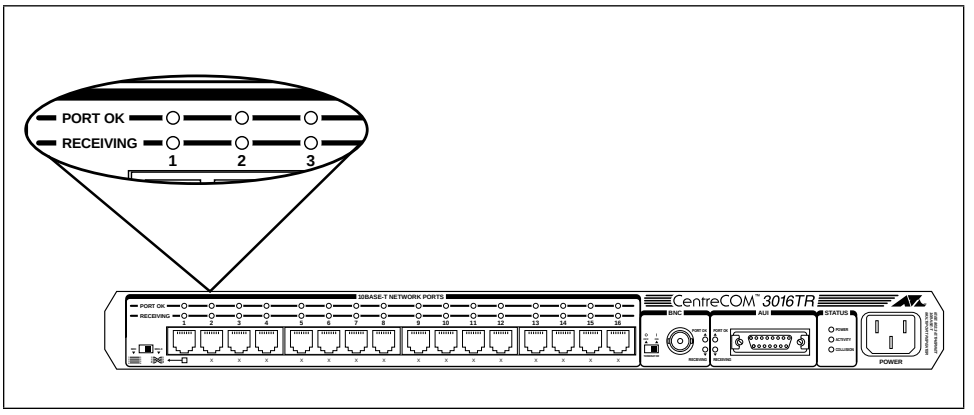

Figure 11: AT-3016TR Port Indicators

PORT OK—This LED indicates that a valid link has been established and the port is not partitioned.

RECEIVING—This LED flashes when incoming packets are present on the respective segment.

Chapter 5

AT-3024TR Connectivity

Front Panel Layout

The AT-3024TR Multiport Repeater has 24 10BASE-T network ports supplied with shielded RJ45 connectors. The front panel layout is shown in Figure 12. Note that the ports are double-stacked, in two banks of six ports each.

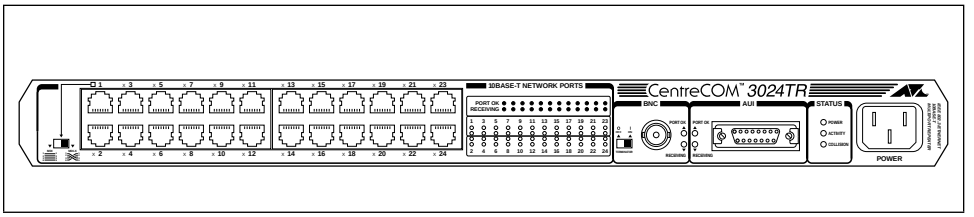

Figure 12: AT-3024TR Front Panel Layout

Port Indicators

The AT-3024TR Repeater includes paired LEDs for each port, arranged in a central bank to provide status information easily, as shown in Figure 13.

Note The upper portion of the 10BASE-T ports display provides a key that the upper LED in each pair indicates PORT OK and the lower LED indicates RECEIVING. The lower part of the display shows the actual LEDs, which are arranged in two tiers with the odd-numbered ports on the top and the even-numbered ports on the bottom.

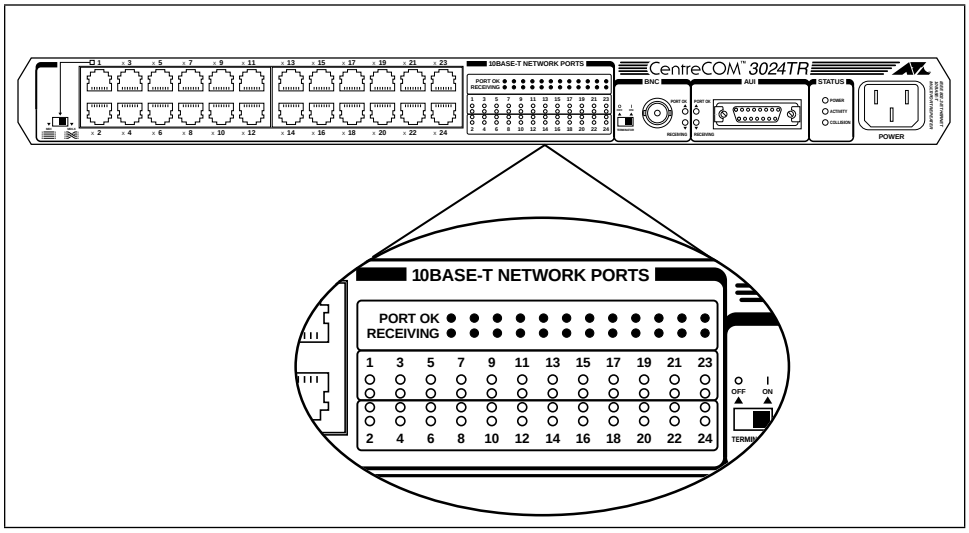

Figure 13: AT-3024TR Port Indicators

PORT OK—This LED indicates that a valid link has been established and the port is not partitioned.

RECEIVING—This LED flashes when incoming packets are present on the respective segment.

Chapter 6

Troubleshooting

10BASE-T Cabling

If the Power LED is not lit

- ❑ Check your power connections.

If the Port OK LED is not lit

1. Check that the device at the opposite end of the UTP link is powered on, and that the cable is properly connected.
2. Check that the proper cable pin-out is used. If another manufacturer's 10BASE-T device is used on the opposite end of the UTP link, check that it is true 10BASE-T.

If only one segment is non-functional, try another port to determine if the port or cable segment is at fault.

Note UTP cable wiring is the most common cause of non-functional segments at installation time. Use only UTP cable Level 3 or above designed for use in 10BASE-T applications. 10BASE-T wiring lengths should not exceed 100 meters (328 ft.). The wiring should be routed away from devices known to emit electromagnetic interference, such as fluorescent lights, power transformers, and relay equipment.

Collision LED

If the Collision LED is flashing excessively, make certain that the SQE/ Heartbeat Test function is disabled on the transceiver attached to the AUI port. Repeaters do not want the SQE/Heartbeat Test enabled.

Excessive flickering of the Collision LED may indicate too many frame collisions on the segment. This may be caused by an overloaded segment or faulty cable or connection.

If no ports are functional, and the Power LED is illuminated, try a known good repeater to test and validate the segment.

Chapter 7

Configurations

The illustrations in this chapter provide some examples of possible network configurations using CentreCOM AT-30*xx*TR Multiport Repeaters. The catalog is not meant to be exhaustive and may or may not fit your network's requirements. For consistency, the examples show AT-3012TR units, but any combination of the three models may be used interchangeably.

Backbone Connection

Figure 14 illustrates connecting an AT-3012TR to a thick Ethernet backbone supporting 12 10BASE-T Ethernet segments.

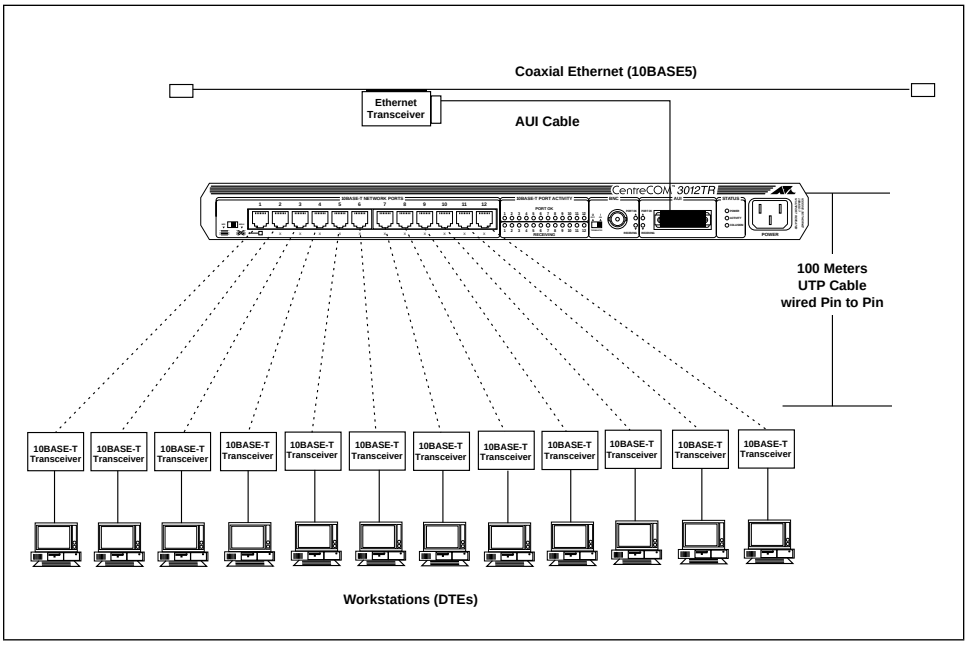

Figure 14: Typical Hub Configuration

Cascade

Cascading of the AT-30*xx*TR Multiport Repeater is also possible following the IEEE 802.3 four repeater rule, as shown in Figure 15.

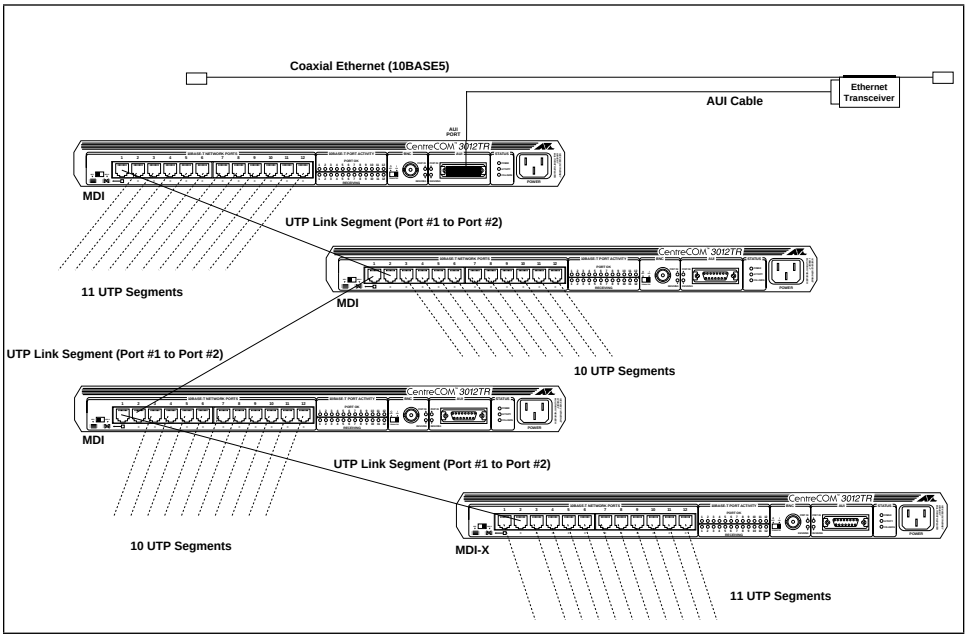

Figure 15: Cascading Hubs

Figure 15 shows the maximum extent to which you can cascade these repeaters. Another way of achieving the same result is to use a dual-port AUI transceiver and a two-level cascade, as shown in Figure 15.

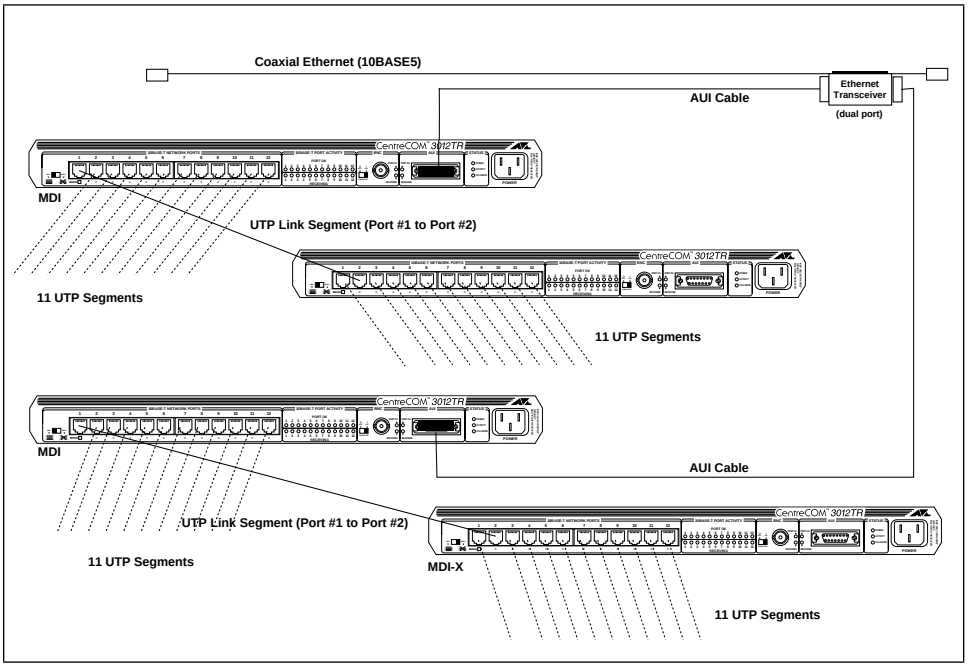

Figure 16: Two-Level Cascade

You can also connect each repeater separately to the backbone, using a four-port AUI transceiver in place of the dual-port one.

BNC Bus

Bussing of the AT-30*xx*TR multiport repeater is another possibility. You can accommodate more nodes on your network if you connect the repeaters through the BNC network port. Note that the worst case, node to node, is through only two repeaters; one provides the UTP station linkage to thinnet, and the second repeater connects thinnet through the BNC bus to the AUI cable. On 10BASE2 thin Ethernet, up to 30 AT-30*xx*TR Hubs may be connected in this way, as shown in Figure 17.

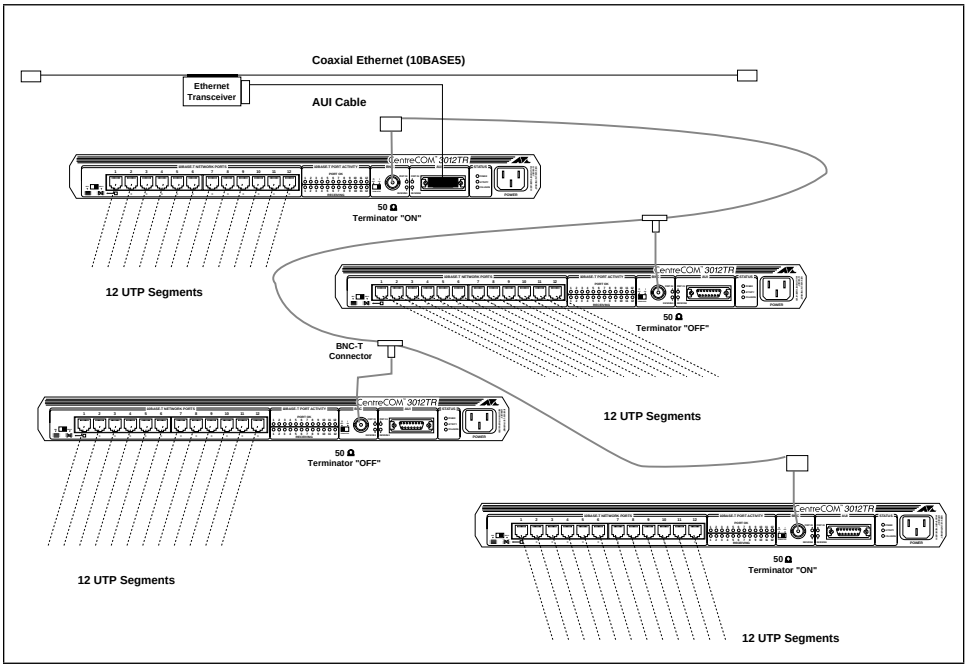

Figure 17: Hubs on a Backbone Using the BNC Network Port

Appendix A

Data Cabling Techniques

The following sections detail cabling techniques and port specifications for IEEE 802.3 media. For comprehensive treatment of these topics, refer to the original IEEE specification.

10BASE-T

UTP (RJ45) links support transmissions up to 100 meters (328 ft.) at 10 Megabit data rates.

A serious problem exists concerning identification of modular cable. There are various grades of voice-quality and data-quality cables available. These can appear to be similar externally, although their high-speed data transmission characteristics are radically different.

The identification problem is exaggerated by the fact that some suppliers have sold purportedly data-quality cables manufactured with voice-quality cabling. If any voice-quality cabling is used in a 10BASE-T network system, data movement is slow, collision-prone or non-existent. To confuse the issue, the Link indicator on the interface will usually indicate a valid link in such a case.

For the foregoing reasons, it is absolutely vital that you use only Level 3, 4 or 5 cabling with 10BASE-T connections. As a rule of thumb, if a cable type is flat, it is usually untwisted, and will cause problems. If a cable is more or less round in section, it will typically work.

Table 2 shows the five common modular cable specifications and their applicability to 10BASE-T network use.

Table 2: Usable and Unusable Twisted Pair Cable

Cable Level	Cable Description	AC Character	Specification	Twist/ Foot	10BASE-T OK?
1	Unshielded untwisted	N/A	CCITT	N/A	NO!
2	Individual UTP	100 Ω ± 30 Ω	RS232 10BASE5 AT&T PDS	N/A	NO!
3	Typical Individual UTP	100 Ω ± 15 Ω	TI, AT&T ISDN 10BASE-T IBM Type 3	3-5	YES
4	Enhanced Individual UTP	100 Ω ± 30 Ω	EIA, TIA 10BASE-T NEMA	5-8	YES
5	Individual UTP	100 Ω ± 30 Ω	EIA, TIA 10BASE-T	8-10	YES

UTP Hub-to-MAU Wiring

The AT-30*xx*TR models have 10BASE-T UTP ports with industry-standard RJ45 receptacles. The standard network connection is from a Data Communications Equipment (DCE) device, such as the repeater, to a DTE device, such as a workstation Network Interface Controller (NIC). This configuration uses a straight-through cable (see Figure 18).

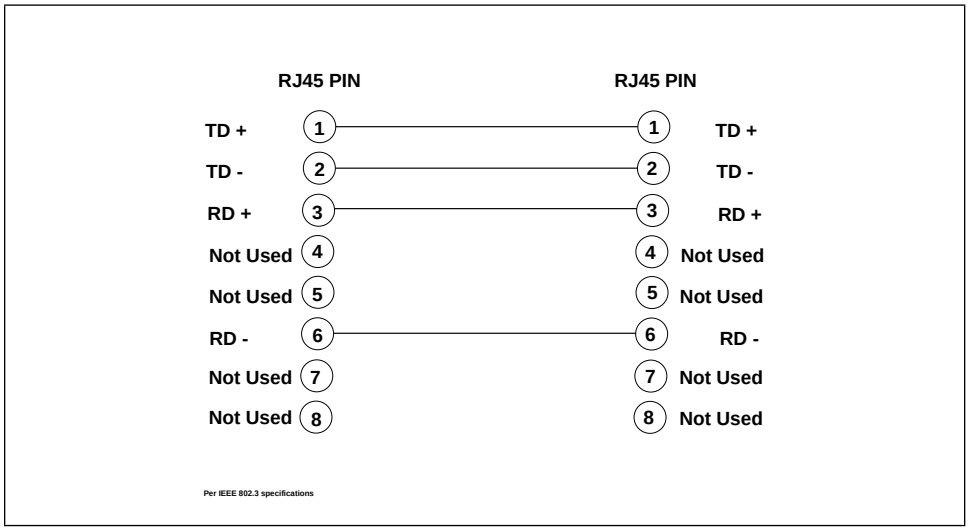

Figure 18: 10BASE-T UTP Cabling Hub-to-MAU or NIC (Straight-Through)

Figure 19 shows a UTP cable with an RJ45 connector. For a 10BASE-T link between a hub and a Media Access Unit (MAU) or NIC, the cable is wired straight-through. That is, an RJ45 receptacle at the hub would wire pin-to-pin to the RJ45 receptacle at the MAU, as shown in Figure 18 on the previous page.

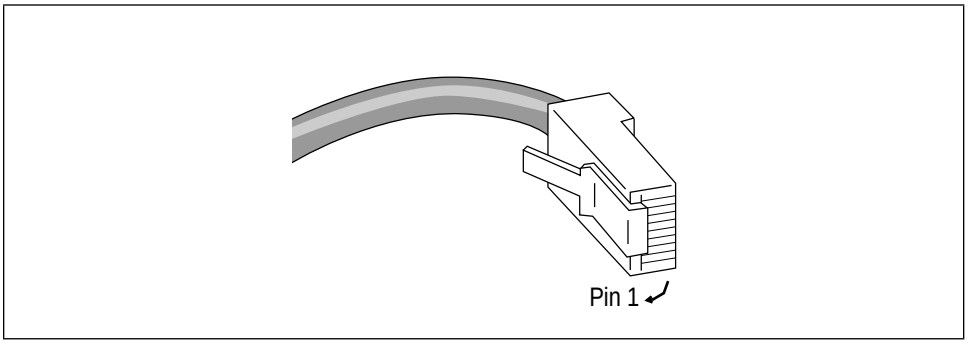

Figure 19: RJ45 Cable

UTP MAU-to-MAU, Hub-to-Hub Wiring

10BASE-T MAU-to-MAU or hub-to-hub wiring generally requires a crossover cable located somewhere along the UTP cable run. This may commonly occur at the punch-down block or between the RJ45 wall receptacle and the workstation. See Figure 20.

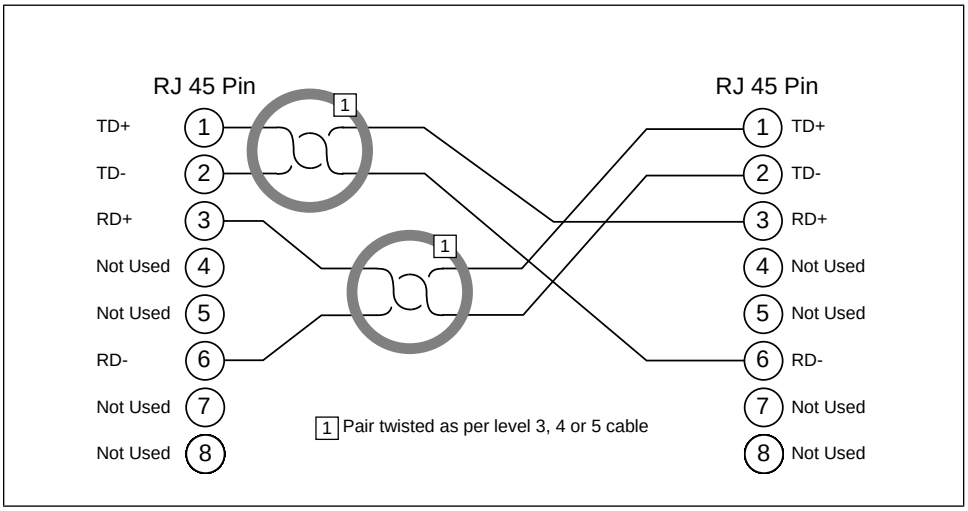

Figure 20: Hub-to-Hub or MAU-to-MAU Wiring

MDI/MDI-X Switch

The AT-30*xx*TR additionally has an MDI/MDI-X pin-out switch that affects RJ45 Port #1. The RJ45 pin-out straight-through (MDI)/crossover (MDI-X) switch enables you to use a straight-through cable (see Figure 19 above) during hub-to-hub connectivity by simply placing the switch in the MDI position. This eliminates the need for making or obtaining a crossover cable, as shown in Figure 20.

Note

The interface type that IEEE specifies as standard for a repeater such as the AT-30*xx*TR is MDI-X. The straight-through/crossover switch merely provides convenience to avoid having to obtain an alternate cable in some applications. If you connect a cable and it does not work, try changing the MDI switch. The rule of thumb is the total number of crossovers must be odd. You cannot harm the repeater by having the MDI switch in the wrong position.

Table 3 shows which position the straight-through/crossover selection switch needs to be for the device configuration shown.

Table 3: MDI and MDI-X Switch Settings for Common Connection[1]

Model	Connected to	MDI	MDI-X
AT-30xxTR	Hub	X	
AT-30*xx*TR	RJ45 Transceiver		X
AT-30*xx*TR	NIC		X

1. This table assumes a straight-through cable is being used. The switch setting are the opposite of what is shown if a crossover cable is being used.

In both the crossover and straight-through instances, the wire is twisted pair. Figure 21 demonstrates usable and unusable cable configurations for the straight-through wire pairing in the UTP environment.

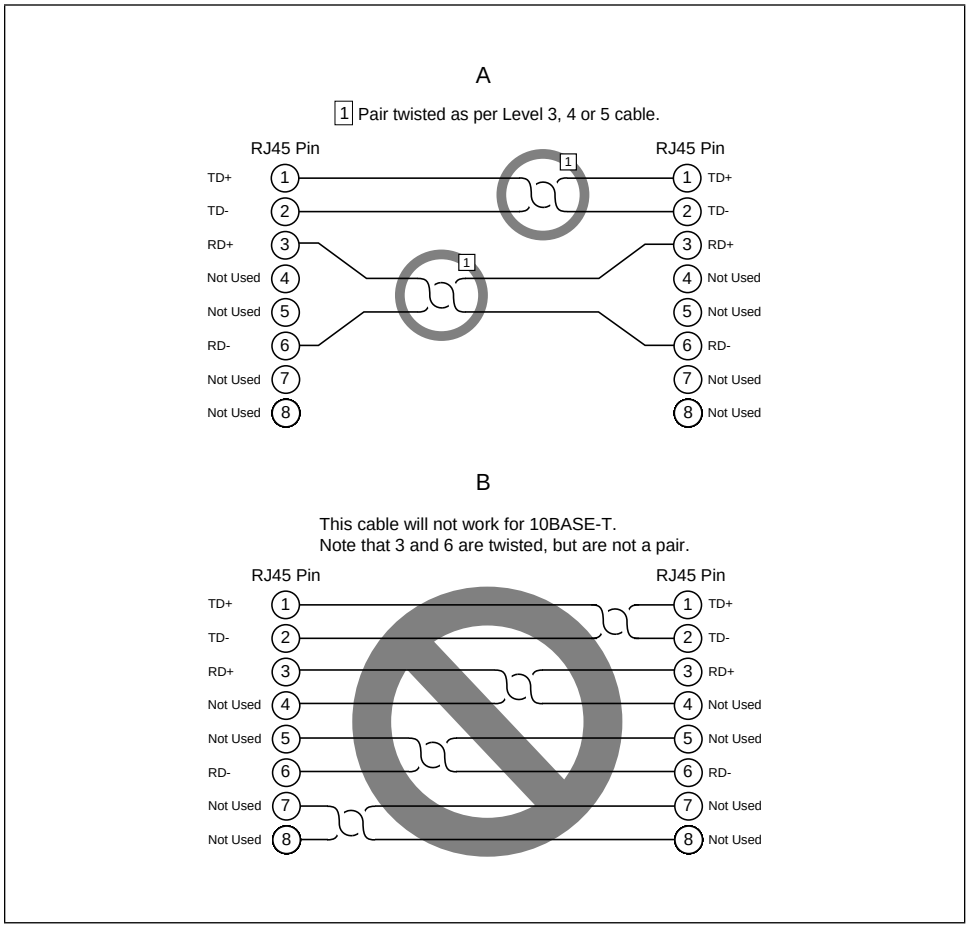

Figure 21: Hub-to-MAU Wiring (A) Usable and (B) Unusable

Diagram A is correct because the proper pairs are twisted together. Diagram B is incorrect because the wires for the receive pair, pins 3 and 6, are not twisted together. This could result in excessive common mode noise and an unacceptably high data error rate.

If you pair pins incorrectly, for example as shown in Figure 21, Diagram B, your network may have a high data error rate. In a straight-through cable, the transmit pins, 1 and 2, are paired, as are the receive pins, 3 and 6. In a crossover cable (Figure 20), pins 1 and 2, TD+ and TD-, are paired, as are pins 3 and 6, RD+ and RD-. When pins 1 and 2 are crossed over, they connect to pins 3 and 6 respectively, and pins 3 and 6, when crossed over, connect to pins 1 and 2 respectively.

10BASE5 (Thick) Ethernet

When configuring 10BASE5 coax segments, IEEE 802.3 specifications allow 100 MAU attachments or less, spaced at multiples of 2.5 meters (8.2 ft.) measured accurately from the cable end (50 Ω terminator included). The 10BASE5 cable segment cannot exceed 500 meters (1,640 ft.) in length. Worst case "end-to-end" propagation delay of a 10BASE5 coax segment is 2165 ns. Propagation delay of 10BASE5 Ethernet coax is calculated at 4.33 ns/meter. Both ends of the segment must be terminated with a 50 Ω termination with a power rating of 0.5 watts or greater. Earth grounding of the segment shield must take place at only one point on the cable.

AUI Drop Cables

AUI or Drop cables can be no longer than 50 meters (164 ft.) each. Attachments may be made only to the cable ends at the 15-pin D-shell connector. AUI cables may have a maximum 257 ns propagation delay, as used for computing the worst case propagation delay of a cable system. AUI cable propagation delay is approximately 5.13 ns/meter. This cable internally consists of four shielded twisted pair wires with an overall shield and drain wire; a 15-pin D-shell male connector at one end and a 15-pin D-shell female connector at the other end. Cable impedance is nominally 78 Ω. The AUI cable typically connects a transceiver attached to a coaxial segment to a DTE (workstation).

10BASE2 (Thin) Ethernet

When configuring thin coax segments, IEEE 802.3 specifications allow 29 or fewer MAUs per cable segment spaced at no less than 0.5 meter (1.64 ft.). The 10BASE2 cable length cannot exceed 185 meters (607 ft.) per 10BASE2 cable segment. The worst case propagation delay for a 185 meters (607 ft.) thin Ethernet segment is 950.9 ns. The propagation delay for 10BASE2 Ethernet cable is 5.14 ns/meter. Both ends of the segment must be terminated with a 50 Ω termination with a power rating of 0.5 watts or greater. Earth grounding of the segment shield must take place at only one point on the cable.

Appendix B

Glossary

10BASE2—Also called thin Ethernet, thinnet or CheaperNet, a 10 MHz baseband specification. Cable impedance is 50 Ω and maximum coaxial segment length is 185 meters (607 ft.).

10BASE5—Also called thick Ethernet, a 10 MHz baseband specification. Cable impedance is 50 Ω and maximum coaxial segment is 500 meters (1,640 ft.). The cable is commonly referred to as yellow cable. Thick Ethernet cable is typically used as a trunk or backbone path of the network.

10BASE-FL—IEEE 802.3 Fiber Optic Ethernet. A fiber optic standard that allows up to 2,000 meters (6,560 ft.) of multimode duplex fiber optic cable in a point-to-point link.

10BASE-T—IEEE 802.3 UTP Ethernet. Low-cost Level 3 or better UTP wiring affords 100 meters (328 ft.) of point-to-point link segments. UTP uses RJ45 connectors and sometimes 50-pin Telco connectors to a patch panel and runs at 10 MHz.

50-PIN TELCO (RJ21)—This connector is very common in 10BASE-T wiring. As opposed to the RJ45 connector, the 50-pin Telco connector concentrates up to 12 UTP connections onto one connection. This concentration of UTP ports is then broken out for connection to a punch-down block inside a building's wiring closet. 50-pin Telco connections provide a very clean, uncluttered interface to the building's wiring.

AT-ADAPT-2— A harmonica-style adapter that allows direct conversion from a 50-pin Telco connector to RJ45 receptacles.

ATTACHMENT UNIT INTERFACE (AUI)—Connection between a MAU (transceiver) and a DTE (typically a workstation). Includes a 15-pin D-sub connector and sometimes a 15-conductor twisted pair cable. Maximum length is 50 meters (164 ft.).

BACKUP MODULE— A repeater that behaves as the management module when the Master fails in a department concentrator.

BASEBAND COAXIAL SYSTEM—A system whereby information is directly encoded and impressed on the coaxial transmission medium. At any point on the medium, only one information signal at a time can be present without disruption.

BAYONET NUT COUPLE (BNC) CONNECTOR—A 10BASE2 thin coax connector with push-on BNC locking lug that quickly locks into place with a half twist.

BIT RATE (BR)—The rate of data throughput on the medium in bits per second. Ethernet specifies 10 million bits per second.

BIT TIME—The duration of one bit symbol (1/BR). Ethernet specifies a bit time of 100 ns.

CARRIER SENSE—In a LAN, an ongoing activity of a data station to detect whether another station is transmitting.

CARRIER SENSE MULTIPLE ACCESS with COLLISION DETECT (CSMA/CD)—This is the access method employed by IEEE 802.3 LAN transceivers, by which multiple stations compete for use of the transmission medium (coax cable) for data packet transmission. It provides for a level of error detection should that transmission be corrupted or impeded by contention for the transmission medium.

COAX SEGMENT—A segment of Ethernet cable that contains MAUs.

COAXIAL CABLE—A two-conductor (center conductor, shield system), concentric, constant impedance transmission line used as the trunk medium in the baseband system.

COAXIAL CABLE SEGMENT—A length of coaxial cable sections and coaxial connectors, terminated at each end in its characteristic impedance.

COLLISION—An unwanted condition that results from concurrent transmissions on the physical medium.

COMPATIBILITY INTERFACE—The MDI coaxial cable interface and the AUI branch cable interface, the two points at which hardware compatibility is defined to allow connection of independently designed and manufactured components to the baseband transmission system.

CROSSOVER—Wiring used when connecting a 10BASE-T MAU to another 10BASE-T MAU or a 10BASE-T hub to another 10BASE-T hub. For example, one 10BASE-T MAU has the TD pair on the same pins as another 10BASE-T MAU. If pins were wired straight, there would be two transmitters on one pair and no receiver. As a solution, the crossover cable crosses the TD pair with the RD pair, to connect the TD pins on one end to the RD pins at the other end.

D-SUB CONNECTOR—The AUI cable uses 15-pin D-sub connectors. “D” refers to the shape of the connector shell. Also called miniature D, DB15, or DIX connectors.

DATA COMMUNICATION EQUIPMENT (DCE)—In RS232 specification, a module, such as a modem, for connecting a DTE to other equipment. A repeater connected to a terminal or workstation for Omega management use is wired as a DCE.

DATA TERMINAL EQUIPMENT (DTE)—In RS232 specification, a module typically at the end of a segment (i.e., uninterrupted length of Ethernet cable). The DTE could be an Ethernet workstation, repeater or bridge.

DEPARTMENT CONCENTRATOR—Hub that provides a large number of workstation connections. The term department concentrator refers to multiple repeaters housed in an AT-36C8 chassis. See Hub/Repeater, Repeater.

DIX CONNECTOR—See D-Sub Connector

FOIRL — A fiber optic standard that allows up to 1,000 meters (3,280 ft.) of multimode duplex fiber optic cable in a point-to-point link.

HARMONICA ADAPTER—This adapter provides a simple way to convert the 50-pin Telco connection to RJ45 connections. See AT-Adapt-2.

HEARTBEAT—See SQE

HOT SWAPPING— The process of replacing a hub module without bringing down the network. This process occurs by sliding an active module into a fully powered up concentrator, replacing a failed module.

HOUSE WIRING—House wiring is the existing wiring inside a building. This wiring generally originates from one or more wiring closets, such as a telephone room. Some older buildings may have wiring unsuitable for 10 megabit data rates. In these circumstances, it is recommended that the wiring be tested with a 10BASE-T signal/wire tester.

HUB/REPEATER—A hub is a central signal distributor. It is used in a wiring topology consisting of several point-to-point segments originating from a central point. The term hub is often used interchangeably with the term repeater. Multiport 10BASE-T, 10BASE2 and fiber optic (10BASE-FL, FOIRL) repeaters are considered hubs. See Repeater.

HUB-to-HUB WIRING—See MAU-to-MAU Wiring

HUB-to-MAU WIRING—UTP cables for 10BASE-T hub-to-MAU or NIC cards are wired straight-through. An RJ45 receptacle at the hub would wire pin-to-pin to the RJ45 receptacle at the MAU.

IMPEDANCE—An electrical characteristic of a circuit dealing with the combination of the AC and DC resistance and the appearance of that resistance to attached circuits.

JABBER LOCK-UP—The MAU's ability to automatically inhibit the transmit data from reaching the medium if the transmit data time exceeds a specified duration. This duration is in the range of 20 ms to 150 ms. Jabber lock-up protects the medium from being overrun with data packets from a possibly defective device.

JAM—This is a term used to describe the collision reinforcement signal output by the repeater to all ports. The jam signal consists of 96 bits of alternating 1s and 0s. The purpose is to extend a collision sufficiently so that all devices cease transmitting.

JITTER—The shift of the data bit in respect to a standard clock cycle. Jitter is undesirable and must be minimized.

LINK SEGMENT—The link segment of coaxial cable is a segment that has no MAU devices, but links together two LAN devices such as repeaters.

LINK TEST—In 10BASE-T Ethernet there is a link test function that validates the UTP link. This consists of a pulse transmitted from point A on one pair that is validated at point B. Point B also transmits a pulse on the second pair to be validated by point A. These pulses occur during media idle states (in between packets).

MANAGED MODULE— An intelligent repeater in a department concentrator chassis that makes management data available to the Master.

MANAGEMENT AGENT—Software that is used to view hub activity and set hub variables.

MASTER—A repeater in the topmost position in a department concentrator chassis that contains and downloads the management agent software to Backup and Slaves. The Master contains the only active image of the management agent and controls the management functions of the Backup and Slaves.

MAU—See Medium Attachment Unit

MAU-to-MAU, HUB-to-HUB WIRING—10BASE-T MAU-to-MAU or hub-to-hub wiring generally requires a crossover cable located somewhere along the UTP cable run. This may commonly occur at the punch-down block or between the RJ45 wall receptacle and the workstation.

MAU/TRANSCEIVER—An Ethernet transceiver is a MAU. A 10BASE-T MAU interfaces the UTP media to an AUI port on a workstation, repeater, bridge or other Ethernet device.

MDI/MDI-X—See Medium Dependent Interface

MEDIUM ATTACHMENT UNIT (MAU)—In a LAN, a device used in a data station to couple the DTE to the transmission medium.

MEDIUM DEPENDENT INTERFACE (MDI)—The mechanical and electrical interface between a hub and a transceiver (MAU). MDI-X is another version of the interface that enables hubs to connect using different pin-outs, thereby avoiding conflicts that occur when receiving and transmitting packets use the same pin-out.

MODULE—A single repeater when it is mounted with other repeaters in an AT-36C*x* or AT-36E*x* department concentrator chassis.

N-SERIES—A barrel shaped, threaded connector used on 10BASE5 (thick Ethernet) coaxial cable.

PATCH PANEL—A 10BASE-T patch panel may be used between a punch-down block and UTP workstation. The patch panel generally has a female RJ45 connector on the front for each workstation and a Telco (RJ21) connector on the back, which is wired to a punch-down block. This provides a convenient way for the installer or network manager to connect the hub 10BASE-T ports into the desired building locations.

POLARITY CORRECTION—Many 10BASE-T UTP ports have a polarity correction function. If the UTP wiring has RD- and RD+ inadvertently crossed, the polarity correction function will sample the signal and electrically swap the wires. If the TD- and TD+ wires are crossed, the correction would occur at the MAU on the other end of the UTP link. This occurs within a single pair and should not be confused with the crossover cable.

PROPAGATION DELAY—The time it takes a signal to travel from the input of a system component to the output. Usually measured in nanoseconds. IEEE 802.3 has specific propagation delay maxima for computing propagation budgets when designing a LAN. Cable length plays a major role in propagation delay; for example, a 50-meter (164-ft.) AUI cable has a maximum allowable propagation delay of 257 ns. The propagation delay of cable depends on the length and velocity factor of the cable type. There are also propagation delays associated with electronics attached to the system.

PUNCH-DOWN BLOCK—The punch-down block is the wiring panel where the house wiring from the building's offices terminates. This is where many 10BASE-T hubs would be located. Wiring installers use a special punch-down tool to insert the UTP wire for data and voice applications.

REPEATER—A device used to extend the length, topology, or interconnectivity of the physical medium beyond that imposed by a single segment, up to the maximum allowable end-to-end trunk transmission line length. Repeaters perform the basic actions of restoring signal amplitude, waveform and timing applied to normal data and collision signals.

RJ45—This connector is a 10BASE-T standard for connecting UTP cabling. It is inexpensive and easy to install onto UTP cable.

SIGNAL QUALITY ERROR (SQE)—Also referred to as Collision or Collision Presence. This occurs when two devices attempt to transmit at the same time, which is an illegal condition. All ATI transceivers test for SQE.

SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)— SNMP is a TCP/IP protocol that generally uses the User Datagram Protocol (UDP) to exchange messages between a management information base and a management client residing on a network. Since SNMP does not rely on the underlying communication protocols, it can be made available over other protocols, such as XNS or DECnet.

SLAVE— A repeater that behaves as a "dumb" module managed by a Master in a department concentrator chassis. Slaves operating standalone perform only simple regeneration and retiming tasks associated with repeating and are not manageable.

SQE TEST—Commonly referred to as Heartbeat, is a special 802.3 signal sent by the MAU to the DTE to test the collision detection function. Some DTE want SQE and others do not. Repeaters do not want the SQE Test.

STANDALONE—Repeater operating as a hub on its own; i.e., not a module among other modules in a department concentrator chassis.

STRAIGHT-THROUGH—A type of wiring connection where the pins of one connector connect to the same pins of another connector. For example, pin 1 of one connector connects to pin 1 of another connector.

TCP/IP PROTOCOLS—A set of protocols for intercomputer communication, including network level (Internet Protocol), transport level (Transmission Control Protocol or TCP) and application level protocols (for example, Telnet terminal emulation). TCP/IP has been used for many years in two country-wide networks, the ARPANET and MILNET. Recently, TCP/IP has become very popular with users of a variety of multi-user computer systems and engineering workstations. Most UNIX computers use TCP/IP over Ethernet as the main intercomputer networking technology. TCP/IP is also popular among PC users, particularly as a means of communication with large multi-user computers.

TELCO CONNECTOR— A 50-pin receptacle that plugs into the front of the hub, enabling cables from external devices to connect to the hub.

THICK ETHERNET—See 10BASE5

THIN ETHERNET—See 10BASE2

TRUNK CABLE—The coaxial cable used to distribute signals over long distances throughout a cable system.

UNMANAGED MODULE— A repeater that behaves as a “dumb” repeater in a department concentrator chassis (i.e., without a Master). It performs simple repeating tasks like packet retiming and regeneration, but is not managed.

UNSHIELDED TWISTED PAIR (UTP)—A cable used in 10BASE-T wiring that consists of at least two twisted pairs of 22 to 26 AWG wire. The pairs should have at least 3 twists per foot and have an impedance of 100 Ω. Level 3, Level 4 and Level 5 UTP cables fit these criteria.

Appendix C

Technical Support Fax Order

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Address _____

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Country _____ **Phone** _____ **Fax** _____

Incident Summary

Model number of Allied Telesyn product I am using _____

Firmware release number of Allied Telesyn product _____

Other network software products I am using (e.g., network managers)

_____

Brief summary of problem _____

_____

Conditions (List the steps that led up to the problem.) _____

_____

_____

_____

Detailed description (Please use separate sheet)

Please also fax printouts of relevant files such as batch files and configuration files.

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North America United States, Canada, Mexico, Central America, South America, Australia, New Zealand	(206) 481-3790
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Appendix D

CentreCOM AT-30xxTR Manual Feedback

Please tell us what additional information you would like to see discussed in the manual. If there are topics you would like information on that were not covered in the manual, please photocopy this page, answer the questions and fax or mail this form back to Allied Telesyn. The mailing address and fax number are at the bottom of the page. Your comments are valuable when we plan future revisions of the manual.

On a scale of 1 to 10 (10 being most important), rate the importance of the following topics in this manual:

Hardware Installation	_____	Diagnostics	_____
Troubleshooting	_____	Configurations	_____
Data Cabling Techniques	_____	Reading the LEDs	_____

I found the following the most valuable _____

_____

_____

I would like the following more developed _____

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